

AN UNUSUAL NEW *PACHYCHERNES* FROM PANAMA AND MEXICO (PSEUDOSCORPIONIDA: CHERNETIDAE)¹

William B. Muchmore²

ABSTRACT: A new species, *Pachychernes zehorum*, is described on the basis of material collected in Panama and Mexico (Chiapas). It is unusual in the structure of the first leg of the male, which has modified setae on the tibia and also a unique depression on the dorsum of the tarsus.

The genus *Pachychernes* was established by Beier (1932), based upon *Chelifer* (? *Atemnus*) *subrobustus* Balzan, from Venezuela. Since then, 7 more species have been assigned to the genus, distributed from Argentina to Florida (Harvey 1991: 611-612; unpublished observations). However, detailed knowledge of the type species is scanty, and the definition of the genus is unsatisfactory; there is good reason to believe that some of the species are improperly assigned. Nevertheless, 3 species are fairly well known and seem to form a coherent group in which males have highly modified setae on the first legs and females have distinctive spermathecae; these are *P. baileyi* Feio (1945), from Brazil (Bahia and Amazonas), *P. shelfordi* Hoff (1946), from Mexico (no further data), and *P. attenuatus* Muchmore (1990), from Mexico (Yucatan and Quintana Roo). A new species, related to these three, has been found in both Panama and Mexico (Chiapas).

Genus *Pachychernes* Beier

Pachychernes Beier, 1932: 114; Beier 1933: 516; Harvey 1991: 611. Type species: *Chelifer* (? *Atemnus*) *subrobustus* Balzan, 1892. Type locality: Caracas, Venezuela.

Pachychernes zehorum, NEW SPECIES

(Figs. 1-4)

Description: Male and female generally similar, except for the genitalia and the conspicuously modified tibia and tarsus of leg I of the male. Palps dark reddish brown, carapace and other parts lighter brown or tan. Carapace a little longer than broad; surface heavily granulate, with 2 shallow transverse furrows; 2 large eyespots; 60-65 short, finely denticulate setae, usually 4 at anterior and 6 at posterior margin. Coxal area unremarkable. Abdominal tergites 1-10 and sternites 4-10 divided; surfaces of anterior tergites granulate, posterior ones scaly; sternites smooth; pleural membranes granulostriate anteriorly, smoothly striate

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² Department of Biology, University of Rochester, Rochester, New York 14627.

posteriorly; setae finely denticulate or acuminate. Tergal chaetotaxy of holotype 8:9:10:10:12:13:13:13:14:12:T3T2T3T:2, others generally similar. Sternal chaetotaxy of holotype ~50:[4-4]:(3)8(3):(1)10(1):20:19:20:22:21:20:T3T7T4T:2, other males similar; sternites 2-4 of allotype with 24:(3)10(3):(1)9(1) setae. Internal genitalia of male typically chernetid in structure, but very large and heavily sclerotized, much like those of *P. baileyi* (see Feio 1945: fig. 19). Spermathecae of female (Fig. 1) apparently like those of *P. bailevi*, *P. shelfordi*, and *P. attenuatus* (see Mahnert 1979: fig. 118; Muchmore 1975: fig. 9, 1990: fig. 6), but in the specimens examined here the entire course of the thin tubules could not be seen.

Chelicera 0.33 as long as carapace; hand with 5 setae, *bs* and *sbs* long, denticulate, others long, acuminate; flagellum of 3 setae; galea of male slender, with 5-6 small rami, that of female heavier and with larger rami, 2 at middle and 4 more terminal.

Palp (Fig. 2) rather slender, patella slightly longer than femur. L/B of trochanter 1.65-1.8, femur 2.6-2.9, patella 2.35-2.7, and chela(without pedicel) 2.75-3.1; L/D of hand(without pedicel) 1.7-1.9; movable finger L / hand L 0.8-0.9. Surfaces moderately to lightly granulate, except chelal fingers smooth; most setae slender, finely denticulate. Trichobothria as shown in Fig. 3. Fixed finger with 55-60 and movable finger with 50-55 cusped teeth. Venom apparatus well developed in movable finger, nodus ramosus at, or just proximad of, level of trichobothrium *r*.

Legs rather slender: leg IV with L/D of femur+patella 2.7-3.1, tibia 3.8-4.4, and tarsus 3.8-4.4. Leg I sexually dimorphic: that of female typically chernetid in structure; that of male with tibia somewhat enlarged and unusually setaceous, and tarsus having an extensive, bare depression in the proximal half of the dorsum (Fig. 4). Tarsus of leg IV with a very long tactile seta 0.3 length of segment from proximal end.

Tritonymph (from Chiapas). Generally similar to adults, but without sexual modifications. Carapace with 2 eyes, 2 faint transverse furrows, and about 50 finely denticulate or acuminate setae. Tergal chaetotaxy 8:8:8:10:11:12:12:12:~. Chelicera with 5 setae on hand and 3 setae in flagellum. Palp with L/B of femur 2.5, patella 2.25, and chela (without pedicel) 2.9; L/D of hand (without pedicel) 1.65; movable finger L / hand L 0.85. Legs as in adults; tarsus with very long tactile seta 0.3 length of segment from proximal end.

Measurements (mm): Male. Figures given first for holotype, followed in parentheses by ranges for 4 paratypes. Body L 3.84 (3.19-3.66). Carapace L 1.25 (1.12-1.23). Chelicera L 0.43 (0.39-0.42). Palp: trochanter 0.67 (0.63-0.69) / 0.385 (0.36-0.385); femur 1.16 (1.04-1.10) / 0.405 (0.36-0.39); patella 1.24 (1.11-1.23) / 0.47 (0.415-0.46); chela (without pedicel) 1.85 (1.76-1.83) / 0.635 (0.56-0.605); hand (without pedicel) 1.07 (0.975-1.07) / 0.62 (0.54-0.60); pedicel L 0.13 (0.13); movable finger L 0.89 (0.865-0.91). Leg I: femur+patella L 0.815 (0.76-0.85); femur 0.39 (0.38-0.435) / 0.26 (0.235-0.265); patella 0.635 (0.585-0.66) / 0.22 (0.21-0.23); tibia 0.59 (0.55-0.62) / 0.18 (0.17-0.18); tarsus 0.615 (0.58-0.64) / 0.13 (0.12-0.125). Leg IV: femur+patella 1.04 (0.96-1.10) / 0.36 (0.36-0.39); tibia 0.88 (0.815-0.88) / 0.20 (0.20-0.21); tarsus 0.59 (0.57-0.605) / 0.14 (0.13-0.14).

Female. Figures given first for allotype, followed in parentheses by ranges for 3 paratypes. Body L 4.11 (3.85-4.87). Carapace L 1.15 (1.21-1.36). Chelicera L 0.39 (0.415-0.43). Palp: trochanter 0.585 (0.64-0.69) / 0.325 (0.355-0.41); femur 0.985 (1.04-1.12) / 0.35 (0.385-0.43); patella 1.03 (1.10-1.19) / 0.39 (0.445-0.51); chela (without pedicel) 1.70 (1.84-1.91) / 0.55 (0.63-0.69); hand (without pedicel) 0.985 (1.06-1.13) / 0.52 (0.615-0.65); pedicel L 0.11 (0.12-0.14); movable finger L 0.815 (0.85-0.89). Leg I: femur+patella L 0.695 (0.75-0.83); femur 0.35 (0.38-0.415) / 0.215 (0.235-0.265); patella 0.54 (0.585-0.62) / 0.19 (0.21-0.235); tibia 0.52 (0.55-0.585) / 0.13 (0.14-0.16); tarsus 0.465 (0.49-0.525) / 0.105 (0.105-0.12). Leg IV: femur+patella 0.96 (1.05-1.16) / 0.31 (0.36-0.415); tibia 0.79 (0.85-0.925) / 0.185 (0.20-0.23); tarsus 0.54 (0.555-0.615) / 0.13 (0.14-0.16).

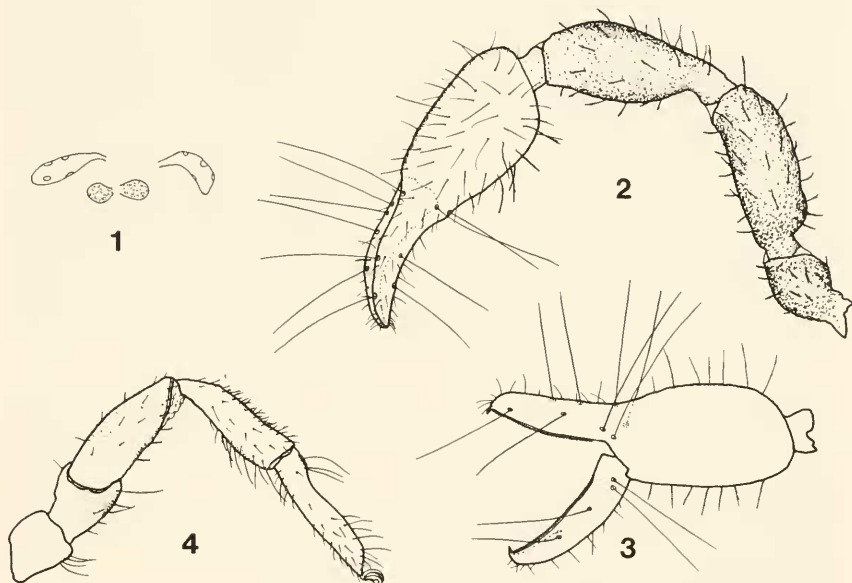
Tritonymph. Body L 3.23. Carapace L 0.93. Chelicera L 0.32. Palp: femur 0.73/0.29; patella 0.74 / 0.325; chela(without pedicel) 1.31 / 0.45; hand(without pedicel) 0.74 / 0.445;

movable finger L 0.63. Leg IV: femur+patella 0.75/0.275; tibia 0.615/0.155; tarsus 0.45/0.11.

Type data: Holotype male (WM7097.01001), allotype female (WM7098.01001), and 8 paratypes (3 males, 4 females, 1 tritonymph) from under bark of live trees along Pipeline Road, Parque Nacional Soberania, PANAMA, 16 January 1988, J. A. Zeh; all but 1 male, 1 female and tritonymph mounted on slides. Three paratypes (2 males, 1 tritonymph) from under bark of trees along trail to ruins, Palenque, Chiapas, MEXICO, 24 January 1976 & 22 January 1985, C. R. Hignutt; mounted on slides. All types deposited in the Florida State Collection of Arthropods, Gainesville, Florida.

Etymology: The species is named in honor of Jeanne A. Zeh and David W. Zeh, who collected and sent me the type specimens from Panama.

Diagnosis: Easily distinguished from all other members of the genus by the first leg of the male, which has both long and short modified setae on the tibia and a unique, distinct depression on the dorsal side of the tarsus.



Figs. 1-4. *Pachychernes zehorum*, new species. 1. Spermathecae of female. 2. Right palp, dorsal view. 3. Left chela, lateral view. 4. Leg I of male.

DISCUSSION

The striking modifications of leg I of the male of *Pachychernes zehorum* are undoubtedly related to courtship and mating. Though no direct evidence exists to support this contention, it seems reasonable, inasmuch as many pseudoscorpions of the family Chernetidae have complex sexual behaviors, during

which the male grasps and manipulates the female (see Weygoldt 1969).

Although it is common in pseudoscorpions of the family Cheliferidae, sexual modification of the first legs of males is rare in the Chernetidae. Modified first legs have been found in only 9 species other than *P. zehorum* among the 600+ described species in the Chernetidae — *Pachychernes baileyi* Feio (1945) from Brazil, *P. shelfordi* Hoff (1946) from Mexico, *P. attenuatus* Muchmore (1990) from Mexico, *Bituberochernes mumae* Muchmore (1974) from Florida and Cuba, *B. jonensis* Muchmore (1979) from the Virgin Islands, *Orochernes nepalensis* Beier (1968) from Nepal, *O. sibiricus* Schawaller (1986) from Siberia, and 2 new species of a new genus from California and Arizona (Muchmore, in prep.). The relationships among these species will be interesting to investigate (in progress).

As mentioned above, the spermathecae in the female of *Pachychernes zehorum* are similar to those of some other species in the genus, namely, *P. baileyi*, *P. shelfordi*, and *P. attenuatus*; no information is available concerning the spermathecae of other species assigned to *Pachychernes* (see Harvey 1991: 611-612). Also, these spermathecae are similar to those of the two known species of *Bituberochernes* Muchmore, namely, *B. mumae* (see Dumitresco & Orghidan 1977: fig. 12B) and *B. jonensis* (Muchmore 1979: fig. 4). It should be noted that the spermathecae of *Chelanops* (*Neochelanops*) *peruanus* Mahnert (1984: figs. 28-29) appear like the foregoing, even though the species is not otherwise similar to *Pachychernes* or *Bituberochernes*.

It seems probable, from the similarity of the first pedal tarsi of males and the spermathecae of females, among other characters, that the genera *Pachychernes* and *Bituberochernes* are closely related; a more detailed examination of this situation is in progress.

The occurrence of this species in Panama and Mexico strongly suggests that it is widely distributed through Central America.

All of the specimens of *P. zehorum* were collected from under loose bark of standing trees. Concerning those from Panama, D. W. Zeh comments (in litt.), "We did see clear evidence that this species feeds on ants. Several of the individuals we sent you were collected from under bark in close association with ant corpses." The identity of the ants upon which these pseudoscorpions presumably feed has not yet been ascertained, but they are not the same ants preyed upon by *Paratemnus elongatus* (Banks) (Zeh & Zeh 1990) [Note: the genus of this species is now *Paratemnoides* Harvey 1991: 469].

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LITERATURE CITED

- Beier, M. 1932. Pseudoscorpionidea II. Subord. C. Cheliferinea. Tierreich 58: 1-294.
- Beier, M. 1933. Revision der Chernetidae (Pseudoscorp.). Zool. Jahrb., Syst. 64: 509-548.
- Beier, M. 1968. Ein neues Chernetiden-Genus (Pseudoscorp.) aus Nepal. Khumbu Himal 3: 17-18.
- Dumitresco, M. & T. N. Orghidan. 1977. Pseudoscorpions de Cuba. Rés. Expéd. Biospéol. Cubano-Roum. Cuba 2: 99-122.
- Feio, J. L. de Araujo. 1945. Novos pseudoscorpões da região neotropical (com a descrição de uma subfamília, dois gêneros e sete espécies). Bol. Mus. Nac., Rio de Janeiro, n.s. Zool. 44: 1-47.
- Harvey, M. S. 1991. Catalogue of the Pseudoscorpionida. Manchester University Press, Manchester, England. 726 pp.
- Hoff, C. C. 1946. Descripción de una especie nueva del género *Pachychernes* Beier, 1932 (Pseudoscorpionida). Ciencia, México 7: 13-14.
- Mahnert, V. 1979. Pseudoskorpione (Arachnida) aus dem Amazonas-Gebiet (Brasilien). Rev. Suisse Zool. 86: 719-810.
- Mahnert, V. 1984. Pseudoscorpions (Arachnida) récoltés durant la mission spéologique espagnole au Pérou en 1977. Rev. Arachnol. 6: 17-28.
- Muchmore, W. B. 1974. Pseudoscorpions from Florida. 2. A new genus and species *Bituberochernes mumae* (Chernetidae). Florida Entomol. 57: 77-80.
- Muchmore, W. B. 1975. Use of the spermathecae in the taxonomy of chernetid pseudoscorpions. Proc. 6th Int. Arachnol. Congr. 1974: 17-20.
- Muchmore, W. B. 1979. Pseudoscorpions from Florida and the Caribbean area. 8. A new species of *Bituberochernes* from the Virgin Islands (Chernetidae). Florida Entomol. 62: 313-316.
- Muchmore, W. B. 1990. Pseudoscorpionida. pp. 155-173 In: D. Navarro L. & J. G. Robinson (eds.). Diversidad Biologica en la Reserva de la Biosfera de Sian Ka'an, Quintana Roo, México. Centro de Investigaciones de Quintana Roo, México.
- Schawaller, W. 1986. Pseudoskorpione aus der Sowjetunion, Teil 2. (Arachnida: Pseudoscorpiones). Stuttgart. Beitr. Naturk. (A) 396: 1-15.
- Weygoldt, P. 1969. Biology of the pseudoscorpions. Harvard University Press, Cambridge, Massachusetts. 145 pp.
- Zeh, J. A. & D. W. Zeh. 1990. Cooperative foraging for large prey by *Paratemnus elongatus* (Pseudoscorpionida, Atemnidae). J. Arachnol. 18: 307-311.